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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,664	08/08/2003	jiang ji		1663

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JIANG JI
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SALEM, NH 03079

EXAMINER

FORTUNA, ANA M

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

VA-10

Office Action Summary	Application No.		Applicant(s)	
	10/604,664		JI, JIANG	
	Examiner		Art Unit	
	Ana M. Fortuna		1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>98/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-2, drawn to a composite membrane, classified in class 210, subclass 490.
 - I. Claims 13-17, drawn to a process of making a membrane, classified in class 264, subclass 41.
 - II. Claim 18, drawn to a process of using a membrane in multiple separations, classified in class 210, subclass 651.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the membrane can be made by conventional phase separation including liquid non-solvents pore former, e.g water, alcohol, etc.
3. Group I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the membrane as claimed can be used in gas separation.

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4. Groups II and III are related as process of using the membrane made by the particular process, for the reasons discussed above, restriction is applied.

5. Because these inventions are distinct for the reasons given above and the search required for Group II and III is not required for Group I, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Jiang Ji on 9/22/05 a provisional election was made with traverse to prosecute the invention of group I, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-16 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

7. Claims 4, 6, 11, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 4, the term "hydrophobic" is unclear as to whether "hydrophobic is intended.

In claim 6, last two lines; the term "as well as other crosslinked polymers " renders the claim indefinite in regard to what polymers are intended.

Claim 11 is indefinite regarding to what membrane shape is intended; is the shape tubules, tapered tube, etc.?

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1- 9, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mahendran et al (US 5,914,039)(hereinafter '039).

Patent '039 discloses a membrane including the elements (i)-(iii) as claimed in claim 1 (Fig. 1, elements 39, 39', 37, and 38, column 3, lines 52-63, column 7, lines 18-33, column 8, lines 21-39).

Adding other polymeric additives is also disclosed, e.g. polymeric derived salts; sulfonated polysulfone (column 7, lines 58-65).

Claim 2 is also disclosed (column 8, lines 230-34).

Re: claim 3, the middle layer is formed from organic polymer, e.g. hydrophilic PVDF (column 7, second paragraph).

Limitations of claims 4-6 are further disclosed in patent '039 (see column 7, lines 1-36)

Re: claims 7-9, the membrane in tubular or hollow fiber shape is disclosed (column 1, lines 11-26, column 11, lines 39-54, claim 1).

Re: claim 12, the claimed membrane properties are disclosed in column 10, lines 45-56).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10-11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahendran et al (5,914,039)(hereinafter 'patent 039) as applied to claim 1 above, and further in view of Strobel et al (5, 766, 473)(hereinafter patent '473). Patent '039 discloses film formation of the claimed membrane composition, coating spheres or particles with the particular support is not disclosed. It would have been obvious to one skilled in the art at the time the invention was made to use any support, e.g. flat, tubular, or particles for the membrane depending on the intended use, spherical membrane or particles will be suitable for example infiltration in packed columns or in chromatographic separations. Patent '473 teaches hydrophilic porous particles or spheres including a substrate and a coating of hydrophilic membrane (abstract, column 4, lines 5-20 and last paragraph); the substrate materials are also disclosed (column 5, lines 5-61). It would have been obvious to one skilled in the art at the time the invention was made to use a polymeric substrate with spherical shape, as disclosed in '473), to support the membrane of '039, depending on the desired configuration or intended use. As to claim 11, other configurations, such as tubules (e.g. flat or oval shape tube, it would have been obvious to one skilled in the art at the time the invention was made,

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and can be achieved by shaping or molding the polymeric support before coating, since the support is flexible, modifications of the membrane diameter shape can be within the knowledge of the skilled artisan.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahendran et al (5,914,039)(hereinafter 'patent 039) as applied to claim 1 above, and further in view of Cooper et al (3,676,193)(hereinafter patent '193). Patent '039 fails to disclose the coating solutions of different polymers, as claimed in a second embodiment of claim 2. Patent '193 teaches a braided support impregnated and coated with a first polymer, coating the support to form a layer on the braided polymeric material, and further using the coated support to cast a film of an additional polymeric membrane, to increase the thickness of the membrane is disclosed (see entire disclosure, in particular claims 1, 8-11, and 21). Based on the discussed teachings, it would have been obvious to one skilled in the art wishing to have a composite membrane on a braided support with distinct layers of polymer, to use the treated support of '193, which contains a layer of polymer, e.g. polyepoxy, polyurethane, etc (column 8, second paragraph), as support, and further cast the membrane with the hydrophilic membrane of '039, e.g. to provide strength to the membrane, and inherent (as produced by epoxy polymer, as claimed in claim 6) easier binding between the hydrophilic membrane and the support.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additionally cited prior art teach composite membranes including a support and a membrane made by phase inversion of hydrophobic and hydrophilic polymer dope in a solvent, optionally non-solvents, surfactants, pore former, e.g. salts. Additionally hydrophilic polymers and hydrophobic polymers are also discussed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Ana M Fortuna', written over the printed name.

Ana M Fortuna
Primary Examiner
Art Unit 1723

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